



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,466	05/17/2006	Howard Robert Harrison		7055

7590 04/22/2011
Distributed Thermal Systems
2914 South Sheridan Way
Suite 100
Oakville, ON L6T7L8
CANADA

EXAMINER

KERSHTEYN, IGOR

ART UNIT	PAPER NUMBER
----------	--------------

3745

MAIL DATE	DELIVERY MODE
-----------	---------------

04/22/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,466	HARRISON, HOWARD ROBERT	
	Examiner	Art Unit	
	Igor Kershteyn	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-101 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 32-101 is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 1, 2, 32, and 67 are objected to because of the following informalities:

All paragraphs in claims 1, 32, and 67 begin with a capital letter.

Claim 2 ends with a semicolon instead of a period.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 22 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 recites "other internal features" which is indefinite because it is not clear what are "other internal features" are.

Claim 22 recites the limitation "said enclosure" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 3745

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 8-10, 13, 18, 19, 22, 24, 26, 28, and 29 are rejected under 35

U.S.C. 102(b) as being anticipated by Chang (6,244,818).

In figures 5A, 5B, and 7, Chang teaches a series fan assembly comprising: a) A primary fan 51; b) A secondary fan 52; in series with said primary fan; c) A flow modification element 503; configured to reduce swirl and mounted between said primary fan and said secondary fan; d) A connecting sleeve 50,501, wherein said connecting sleeve directs the output of said primary fan through said flow modification element and into said secondary fan.

Claims 1, 2, 4, 8-10, 13, 18-20, 24, 26, 28, and 29 are rejected under 35

U.S.C. 102(b) as being anticipated by US Patent Publication 20030026691A1.

In figures 2-7, '691 teaches a series fan assembly comprising: a) A primary fan 41; b) A secondary fan 42; in series with said primary fan; c) A flow modification element 23; configured to reduce swirl and mounted between said primary fan and said secondary fan; d) A connecting sleeve 43,53, wherein said connecting sleeve directs the output of said primary fan through said flow modification element and into said secondary fan.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-7, 10-12, 14, 16, 17, 20, 21, 23, 25, 27, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (6,244,818) in view of Littleford et al. (6,076,739).

Chang teaches all the claimed subject matter except that he doesn't teach more than two fans connected in series, each separated by a distance and an appropriate said flow modification element, wherein said flow modification element is a filter, wherein said flow modification element is a heat exchanger, said flow modification element is an electromagnetic shield, wherein said flow modification element is comprised of a series of tubes with an air funnel at each entry point, said air funnels opening towards and skewed towards the source of the airflow as it comes off the blades of said primary fan, wherein the fan blades of said primary fan and the fan blades of said secondary fan may be configured with adjustable pitch to return to a low airflow impedance position when locked, the rotating speed of said primary fan or said secondary fan may be increased to compensate for the failure of another fan, an indicator means to alert an operator regarding the location and status of a faulty component, a physical means to prevent the accidental reverse installation of said primary fan, said flow modification element, or said secondary fan, said primary fan

Art Unit: 3745

and/or said secondary fan may have an integrated stator on the outlet side, the direction of flow of said combined output remains consistent in the event of a failure of said primary fan or the failure of said secondary fan, a means to attach said connecting sleeve to said enclosure, sensors attached to said primary fan and said secondary fan, and capable of predicting the impending failure of said primary and said secondary fan, said connecting sleeve may be configured with octagonal corners or other internal features capable of flow modification, shims to allow the installation of less than maximum capacity standard sized fans, said shims being installed with said primary fan or said secondary fan to hold it securely in place; wherein said shims may be removed at any time to allow said primary fan or said secondary fan to be upgraded, said connecting sleeve is adapted to mount obliquely on the cooling fin surface of a heat sink and to direct an impingement flow of air into said heat sink, wherein said controller is configured to maintain said combined output above a minimum control level at all times, in the event of the failure of said primary fan or said secondary fan.

Littleford et al., in figures 1, 4, 5, and 8, teaches an arrangement having more than two fans connected in series, each separated by a distance and an appropriate said flow modification element, wherein said flow modification element is a filter 106, wherein said flow modification element is a heat exchanger 130, said flow modification element is an electromagnetic shield, wherein said flow modification element is comprised of a series of tubes with an air funnel at each entry point, said air funnels opening towards and skewed towards the source of the airflow as it comes off the blades of said primary fan, wherein the fan blades of said primary fan and the fan

Art Unit: 3745

blades of said secondary fan may be configured with adjustable pitch to return to a low airflow impedance position when locked, the rotating speed of said primary fan or said secondary fan may be increased to compensate for the failure of another fan, an indicator means to alert an operator regarding the location and status of a faulty component, a physical means to prevent the accidental reverse installation of said primary fan, said flow modification element, or said secondary fan, said primary fan and/or said secondary fan may have an integrated stator on the outlet side, the direction of flow of said combined output remains consistent in the event of a failure of said primary fan or the failure of said secondary fan, a means to attach said connecting sleeve to said enclosure, sensors attached to said primary fan and said secondary fan, and capable of predicting the impending failure of said primary and said secondary fan, said connecting sleeve may be configured with octagonal corners or other internal features capable of flow modification, shims to allow the installation of less than maximum capacity standard sized fans, said shims being installed with said primary fan or said secondary fan to hold it securely in place; wherein said shims may be removed at any time to allow said primary fan or said secondary fan to be upgraded, said connecting sleeve is adapted to mount obliquely on the cooling fin surface of a heat sink and to direct an impingement flow of air into said heat sink, wherein said controller is configured to maintain said combined output above a minimum control level at all times, in the event of the failure of said primary fan or said secondary fan. See the entire description.

Art Unit: 3745

Since Chang and Littleford et al. are analogous art, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the fan unit of Chang with the above elements as taught by Littleford et al. for the purpose of providing an air conditioning system that provides a reliable and effective power consuming arrangement.

Claims 3-5, 7, 11, 12, 14-17, 21-23, 25, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Publication 200300266691 in view of Edmunds et al. (6,407,918).

'691 teaches all the claimed subject matter except that he doesn't teach the series fan assembly is configured to maintain the combined output of said primary fan and said secondary fan above a minimum level at all times, in the event of the failure of said primary fan or said secondary fan, more than two fans connected in series, each separated by a distance and an appropriate said flow modification element, said flow modification element is a filter, said flow modification element is an electromagnetic shield, said flow modification element is comprised of a series of tubes with an air funnel at each entry point, said air funnels opening towards and skewed towards the source of the airflow as it comes off the blades of said primary fan, the fan blades of said primary fan and the fan blades of said secondary fan may be configured with adjustable pitch to return to a low airflow impedance position when locked, the rotating speed of said primary fan or said secondary fan may be increased to compensate for the failure of another fan, wherein two or more such series fan assemblies may be mounted in

Art Unit: 3745

parallel to provide greater performance and fault tolerance, an indicator means to alert an operator regarding the location and status of a faulty component, a physical means to prevent the accidental reverse installation of said primary fan, said flow modification element, or said secondary fan, the direction of flow of said combined output remains consistent in the event of a failure of said primary fan or the failure of said secondary fan, a means to attach said connecting sleeve to said enclosure, sensors attached to said primary fan and said secondary fan, and capable of predicting the impending failure of said primary and said secondary fan, said connecting sleeve may be configured with octagonal corners or other internal features capable of flow modification, said connecting sleeve and said flow modification element may be configured as a independent module to be later attached to a variety of standard size fans, and comprising shims to allow the installation of less than maximum capacity standard sized fans, said shims being installed with said primary fan or said secondary fan to hold it securely in place; wherein said shims may be removed at any time to allow said primary fan or said secondary fan to be upgraded, wherein said connecting sleeve is adapted to mount obliquely on the cooling fin surface of a heat sink and to direct an impingement flow of air into said heat sink, wherein said controller is configured to maintain said combined output above a minimum control level at all times, in the event of the failure of said primary fan or said secondary fan.

Edmunds et al., in figures 1-3, teaches an arrangement having the series fan assembly that is configured to maintain the combined output of said primary fan 10 and said secondary fan 18 above a minimum level at all times, in the event of the failure of

Art Unit: 3745

said primary fan or said secondary fan, more than two fans connected in series, each separated by a distance and an appropriate said flow modification element 26,28,30, said flow modification element is a filter, said flow modification element is an electromagnetic shield, said flow modification element is comprised of a series of tubes with an air funnel at each entry point, said air funnels opening towards and skewed towards the source of the airflow as it comes off the blades of said primary fan, the fan blades of said primary fan and the fan blades of said secondary fan may be configured with adjustable pitch to return to a low airflow impedance position when locked, the rotating speed of said primary fan or said secondary fan may be increased to compensate for the failure of another fan, wherein two or more such series fan assemblies may be mounted in parallel to provide greater performance and fault tolerance, an indicator means to alert an operator regarding the location and status of a faulty component, a physical means to prevent the accidental reverse installation of said primary fan, said flow modification element, or said secondary fan, the direction of flow of said combined output remains consistent in the event of a failure of said primary fan or the failure of said secondary fan, a means to attach said connecting sleeve to said enclosure, sensors attached to said primary fan and said secondary fan, and capable of predicting the impending failure of said primary and said secondary fan, said connecting sleeve may be configured with octagonal corners or other internal features capable of flow modification, said connecting sleeve and said flow modification element may be configured as a independent module to be later attached to a variety of standard size fans, and comprising shims to allow the installation of less than maximum capacity

Art Unit: 3745

standard sized fans, said shims being installed with said primary fan or said secondary fan to hold it securely in place; wherein said shims may be removed at any time to allow said primary fan or said secondary fan to be upgraded, wherein said connecting sleeve is adapted to mount obliquely on the cooling fin surface of a heat sink and to direct an impingement flow of air into said heat sink, wherein said controller is configured to maintain said combined output above a minimum control level at all times, in the event of the failure of said primary fan or said secondary fan.

.

Since '691 and Edmunds et al. are analogous art, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the fan of '691 with the above elements as taught by Edmunds et al. for the purpose of providing an air conditioning system that provides a reliable and effective power consuming arrangement.

Allowable Subject Matter

Claims 32-101 are allowed.

Prior Art

Prior art made of record but not relied upon is considered pertinent to Applicant's disclosure and consist of two patents.

US Patents 3,342,254 and 5,839,205 are cited to show a serial impellers having a flow modifying structure in between.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Igor Kershteyn whose telephone number is (571) 272-4817. The examiner can normally be reached on regular.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571)2724820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Igor Kershteyn/
Primary Examiner, Art Unit 3745

Igor Kershteyn
Primary Examiner
Art Unit 3745